

# BARRIERS AND SUPPORTS FOR HEALTHY EATING AND PHYSICAL ACTIVITY FOR FIRST NATION YOUTHS IN NORTHERN CANADA

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## ABSTRACT

**Objectives.** To investigate barriers and supports for healthy eating and physical activity in youths in a remote sub-arctic community, Fort Albany First Nation, Ontario, Canada.

**Study design.** A qualitative multi-method participatory approach.

**Methods.** The study included a purposive convenience sample of two adult (n = 22) and three youths (n = 30; students in grades 6 to 8) focus groups, unstructured one-on-one interviews with adult key informants (n = 7), and a scan of the community environment. Data were coded and analysed by hand and using NVivo software. Hurricane thinking and concept mapping were used to illustrate findings and relationships between concepts.

**Results.** Dominant emerging themes included empowerment, trust, resources, barriers and opportunities, while major sub-themes included food security, cost, accessibility/availability, capacity building, community support, programs/training and the school snack/breakfast program.

**Conclusions.** Numerous barriers to healthy nutrition and physical activity exist in this community and are possibly similar in other remote communities. Empowerment is a core issue that should be considered in the design of public health interventions for First Nations youths in remote sub-arctic communities.

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**Keywords:** healthy eating, physical activity, barriers, First Nations, Sub-Arctic, qualitative analyses

## INTRODUCTION

The prevalence of pediatric overweight and obesity is rising in North America. This is an increasingly important issue among populations undergoing rapid cultural changes, such as Canadian Aboriginal people. The Aboriginal population is particularly susceptible to obesity and related health problems, such as type 2 diabetes (1). Prevalence of type 2 diabetes has increased within the past two decades (2,3). Even more alarming is the observation and increasing trend of type 2 diabetes in Aboriginal children and adolescents (4-6). Both obesity and type 2 diabetes are associated with an unhealthy diet and lack of physical activity (7,8). A recent article by Willows (9) described the limitations of the knowledge on obesity in Aboriginal children and stressed that community-level barriers to activity and healthy eating need to be identified.

In this study, we investigated the barriers and supports which contribute to the food and physical activity behaviours of First Nation (FN) adolescents living in a remote, sub-arctic community, Fort Albany First Nation, Ontario, Canada. A variety of methods of qualitative inquiry were drawn upon to capture the context of food and activity in this community. During November 2004 and May 2005, focus groups with parents and youths, individual interviews with key informants, and an environmental scan were conducted. We discuss how, in this community and likely other remote, sub-arctic FN communities, the barriers and supports for nutrition and physical activity are heightened, interrelated and contribute to much larger social constructs such as empowerment and trust. This study offered the unique opportunity to engage with FN adults and youths and

obtain their perspectives of healthy eating and physical activity.

## MATERIAL AND METHODS

### Community profile and study population

Fort Albany FN is situated on the west coast of James Bay along the Albany River. The Fort Albany reserve is home to approximately 850 Cree people. Fort Albany is geographically remote; it is accessible only by plane year-round, by boat and barge during the ice-free season, and by ice road after freeze-up (10). Fort Albany FN was chosen for this study because the community members had a keen interest in improving the dietary and physical activity habits of their population. Permission to conduct this study was obtained from the Office of Research Ethics at the University of Waterloo, Ontario, Canada.

Data sources included an environmental scan of the community and school, focus group discussions (two with adults and three with youths), and seven individual interviews of key informants.

### Environmental scan

The environmental scan was based on direct observation of the social setting, school and community environments (11,12). The scan was critical to this study because the physical and social environments can be determinants of healthy eating and physical activity (13,14). Observations were recorded in detailed field notes and electronic images, as suggested by Gibbs and colleagues (15). The grocery store was observed for the accessibility of healthy and unhealthy foods. Photographs were taken of most of the food aisles. The costs of specific

**Table I.** Environmental scan observations.

Food	Activity	School	Illness/Health
Major food store*	Adult weekly volleyball game	Classroom during snack time	Hospital
Minor food store 1*	After school activity	Gym class	Health centre
Minor food store 2*		Kitchen	
A feast		Snack/breakfast program	
Family meal			

\*These three stores represent the only retail food outlets in the community

foods were recorded. The recreational facilities, activity schedule for the school gymnasium, and school snack/breakfast program were observed and recorded. Table I lists all of the types and locations of observations included in the environmental scan.

### Participatory approach

Participatory methods are imperative for successful research in Aboriginal communities (16-21). Participants in the present study had a keen interest in the research question. An advisory group representing six key First Nation informants from the health centre, school, and community at large guided approaches and assisted with study procedures (e.g. informing the development of questions and probes used during the focus group discussions). Also, data collection procedures were tailored to the preferences of the participants. Since participatory research places emphasis on conducting research by involving people in a community, it can greatly benefit from community focus group discussions (22, 23). Focus groups are culturally appropriate and have been used successfully in Aboriginal communities for a variety of topics (8,24-26).

### Data sources and collection

Participants were a convenience sample of community members interested in environment and health issues (adults), or were at school on the day of the focus groups (youths). Adult participants were purposively selected

by the researchers according to their position in the community (e.g. educational personnel, health care worker). All discussions and interviews were in English and/or Cree, and interpreters were used when necessary. Verbal consent was obtained, being culturally appropriate for the Western James Bay region for this type of project. Data collection took place in November 2004 and May 2005. Prior contact and discussions with an advisory committee had been made. Detailed notes were taken during each discussion; tape recording was deemed culturally inappropriate by the participants. The adult focus group discussions lasted approximately one hour, while those with the youth focus groups lasted 25 minutes. All focus groups were mixed-gender, held at the participants' preferred location, and at a time determined to be convenient for the participants and other involved members (e.g. teachers).

### Adult Focus Groups

The first focus group discussion took place in a meeting room at the local health centre. A discussion of healthy eating and physical activity took place during a shared meal (27-29). The moderator (LJST) for both adult focus groups was explicitly selected because of his trusting relationship with the community for 18 years as a health care worker and environmental researcher (30).

An informal group conversation approach was utilized. A conversational style of information gathering (similar to a "talking circle") is a

familiar and appropriate method for Aboriginal groups (31-34). Probes were used to stimulate discussion (semi-directed; Table II), with the moderators acting as facilitators and allowing the discussions to go beyond what was asked (35). Probes were based on previous informal conversations with key community members.

**Table II.** Examples of probes used during adult focus group I.

Focus	Probes (Topics)
Physical activity	Supports for activity Facilities for the kids Different programs <ul style="list-style-type: none"> <li>• After school</li> <li>• Physical education teacher</li> </ul> Barriers to activity
Healthy eating	Supports for healthy eating Snack/Breakfast program <ul style="list-style-type: none"> <li>• Extended to lunch program</li> </ul> Food <ul style="list-style-type: none"> <li>• Cost</li> <li>• Variety</li> <li>• Freshness (due date)</li> <li>• Access</li> </ul> Barriers to healthy eating

The second focus group with adults took place in the home of one of the participants. The discussion was more directed and based on a focus group script. The script style and format was guided by Kruger and Casey (22). Questions were developed from previous conversations with community members and influenced by academic literature related to physical activity, nutrition, and Aboriginal participation (36-38).

#### *Youth Focus Groups*

Information and passive consent letters were sent to the students' parents prior to the focus group discussions. Mixed-gender focus groups were conducted with volunteers from grades 6 to 8 in their classroom. Similar to the second adult focus group, a directed focus group script guided the discussion (Table III).

**Table III.** Youth focus group script.

#### *Part A: Introduction to nutrition and physical activity*

1. What kinds of healthy foods do you eat?
2. What kinds of unhealthy foods do you eat?  
Probes: What foods would you like to eat?
3. What kinds of healthy physical activities do you participate in?
4. What kinds of activities do you choose instead of being physically active?  
Probes: What type of activities would you like to do?

#### *Part B: Threats or barriers to healthy eating and regular physical activity*

1. What kinds of things do you think prevent you from eating healthier foods?  
Probes: Are there healthy foods that you like? Can you have these foods regularly?  
Do you prefer foods prepared in a certain way?
2. What kinds of things do you think keep you from being more physically active?  
Probes: Are you able to do the activities/sports that you want?  
Are there times when you can't be active or outside? What are the reasons?

#### *Part C: Opportunities and supports for healthy eating and regular physical activity*

1. What kinds of things do you think could be done to make it easier for you to eat in healthful ways?  
Probes: Consider opportunities at home, school, and in the community for eating healthy.  
What is feasible to change?
2. What kinds of things do you think could be done to make it easier for you to be more physically active?  
Probes: Consider opportunities at home, school, and in the community for being physically active. What is feasible to change?
3. Who do you think can help you to eat healthier and be more active? (e.g. yourself, parents, teachers, community health workers, band council, elders, etc.)

*Individual interviews*

Semi-directed interviews lasting from 15 to 45 minutes were conducted with adult community members. Interviews were held either in the cafeteria at the school, while traveling from one location to another, or in the participant's home. This resulted in little disruption to their work and daily routines.

**Data analyses**

All data sources (photographs, texts from the group discussions, interviews, and field notes) were compiled into one data file. Hence, data analysis did not distinguish between the source of the information. Organization and coding of the data for the qualitative analysis was conducted both by hand and using QSR NVivo® computer software (NVivo, version 2.0; Doncaster, Australia: Sage Publications Software, 2002). It has been demonstrated that a combination of both manual and computer-assisted methods (NVivo) are likely to achieve the best results during qualitative analysis (39).

Initially, the data were segregated and organized into logical and meaningful segments on paper (i.e., factors that impede healthy eating, facilitate healthy eating, impede physical activity, and facilitate physical activity) by hand (40). Subsequently, data were organized into groups or "themes" (41). To increase reliability, the themes were confirmed by a second independent analyst with northern experience and familiarity with qualitative methods and analysis. The data were then imported into NVivo for better management of the data. The thematic analysis involved open coding. Words, sentences and/or paragraphs were assigned to a theme and could belong to more than one theme. Themes were collapsed or expanded, and sub-themes were identified and organized according to the

major themes. Themes and sub-themes were examined for interrelationships using hurricane thinking. Concept mapping was used to visually represent the barriers to healthy eating and physical activity. Both the hurricane diagram and the concept map were revised based on reflections from all authors. A reflexive journal was kept throughout the analysis (11).

*Hurricane Analysis*

Hurricane thinking (42) was used to illustrate the associations between concepts that emerged from the analysis and to gain a new perspective on the data. It was necessary to initially separate nutrition and physical activity concepts, and then link them together based on their common influencers. The preliminary hurricane analysis involved placing some of the major themes into a dichotomous chart format. Further analysis included the addition of categories (sub-themes), continuous re-visitation of the data, and cross-referencing between themes. Categories were observed for trends, matching and obvious mismatching. Throughout this process and through numerous revisions and versions of the hurricane diagram, the dynamic nature of the relationships between themes and sub-themes became more evident. The final revision entailed the removal of extraneous sub-themes to allow for a tighter diagram. At this time, the direction and size of arrows were examined directly with the data to confirm their depiction of the interrelationships between categories. Themes in large bold capital letters represent the major themes that resulted from the analysis. The thickness of the arrows depicts the strength of the relationship; thicker arrows representing stronger relationships, and thinner arrows weaker relationships.

### Concept Mapping

A concept map (43) was developed to depict the internal and external barriers to healthy eating and physical activity. Although the themes and categories included in the concept map are similar to the hurricane diagram, the concept map made it possible to visually distinguish between themes that showed external factors, internal factors, healthy eating, physical activity, and the overlap between eating and physical activity. In Figure 2, the sub-themes were kept in the diagram to provide elaboration on the major themes.

## RESULTS

A total of 25 adult community members participated in this study (Table IV). As a result of purposive sampling, adult participants had a higher employment (health or education fields) rate than the general population of Fort Albany, and all but four were parents. Youth partici-

pants were 30 students enrolled in grades 6 to 8 (gr. 6, n = 10; gr. 7, n = 12; gr. 8, n = 8; 18 girls, 12 boys) from Peetabeck Academy (the K-Gr. 12 school in Fort Albany).

Topics raised by participants during the individual interviews included details of the school environment (including the school snack/breakfast program), aspects of food availability, remoteness, transportation, and family relationships. The topic of physical activity infrequently came up and was not put forward by the interviewer so as not to interfere with the natural progression of conversation. It should be stressed that topics are often discussed tangential to other FN issues.

The analysis revealed a variety of inter-related themes and sub-themes of primarily external contributing factors for healthy eating and physical activity in the FN youths of Fort Albany. The core issue related to healthy eating and physical activity for the community of Fort Albany FN (as depicted in the “eye of the hurricane” in Figure 1) was Empower-

**Table IV.** Characteristics of the adult study participants

Demographic	Detail	Focus group 1 n (%)	Focus group 2 n (%)	Interviews n (%)
Total participants*†		16	6	7
Gender	Male	5 (31)	1 (17)	-
	Female	11 (69)	5 (83)	7 (100)
Age range	20-29	3 (19)	2 (33)	2 (29)
	30-39	9 (56)	4 (67)	3 (42)
	40-49	4 (25)	-	-
	50-59	-	-	2 (29)
Employment status	Employed	10 (63)	5 (83)	6 (86)
	Unemployed	2 (12)	-	1 (14)
	Don't Know	4 (25)	1 (17)	-
Position‡	Health	6 (60)	3 (60)	4 (57)
	Education	1 (10)	1 (20)	3 (43)
	Other	3 (30)	1 (20)	-
Parents	Yes	15 (94)	4 (67)	6 (86)
	No	1 (6)	2 (33)	1 (14)

\* Two participants were involved in focus groups 1, 2, and the individual interviews.

† All participants were of FN ancestry.

‡ Based on employed participants (n = 10, n = 5, n = 6).

ment. Empowerment was defined as “a suggestion which could enable the community to build their capacity for healthier living”. Empowerment was associated with four other major themes, including Trust, Resources, Opportunities, and Barriers. The major sub-themes included food security, cost, accessibility/availability, capacity building/community support, programs/training and the school snack/breakfast program. Figure 1 shows the interrelationships between themes and related sub-themes, as well as the strength between these categories (as shown by thicker arrows). The strongest relationships arose between empowerment and the related themes of trust, resources, and opportunities. The concept map shows barriers to healthy eating and physical activity in Fort Albany youths, and included external and internal contributing factors and themes corresponding to both healthy eating and physical activity. In both Figures 1 and 2, the arrows are not meant to imply causality, only the relationship between categories and the direction(s) of this relationship based on the data analysis.

### Empowerment

Empowerment was a repeated theme throughout the focus groups and interviews. One example of empowerment arose when participants discussed becoming empowered by increasing their health knowledge, but that this was impeded by low literacy levels among both adults and youths. The following is a specific example when the focus group participants identified illiteracy as a barrier to a healthy lifestyle for many people in the community:

*...many people are illiterate...adults and kids...we need to have a learning centre, or some form of adult education...* (Adult Focus Group 1).

Community members often described feeling disempowered when they spoke about the grocery store and their access to healthy foods. A number of key informants mentioned that they had tried to request specific foods from the grocery store without success. Some had complained to the manager about the quality of the produce, but were told not to pursue this issue. They noticed community members buying produce even when it looked somewhat rotten, because that was the only produce available. Even when the fruits and vegetables were no longer fresh, the store would not reduce the price. A sale flyer would come out periodically, but often the foods in the flyer were not in stock. All of the issues related to the grocery store described during the focus groups and interviews depicted the absence of control by the community members to make choices for healthy eating. Empowerment was central to their perception of how to live a healthy lifestyle in the community, as shown in Figure 1.

### Lack of resources

A number of sub themes fell into this overarching category of resources, specifically the lack of resources in various forms. These included the High Cost of Food, Lack of Variety of Foods (including quality and preparation), Lack of Availability of Foods, Lack of Funding, Lack of Personnel (including community activists), Lack of Facilities, and Lack of Equipment. One participant made this statement:

*...I spend \$400 every 2 weeks on food – and that doesn't even buy much!* (Participant #3).

When asked during a youth focus group discussion “What kinds of things do you think prevent you from eating healthier foods?”, a student commented:

*...you need money to buy healthy foods and*



**Trust**

Analysis of the data identified trust as a significant concern in the community. Trust could be reliance on either a person, or an organization in which the participants placed their confidence. An example of (mis)trust in the grocery store manager(s) and the company is displayed in the following texts:

*...the major food store managers claim that they can't put in requests for the food orders, it just gets sent up here... (Participant #1).*

*...managers at the major food store change every 3 years, so they don't get attached to the community and feel for them... (Participant #2).*

**Opportunities**

A function of opportunity is the capability for advancement of the current state (e.g.,

improving current programs, and introducing new programs and facilities). Facilitators included funding and current programs. Barriers included lack of other programs and resources.

Some opportunities existed in Fort Albany. However, these could be enhanced and lead to more opportunities to increase physical activity in youths. An example was the lack of organized sports outside of the school gymnasium.

*...many kids seemed to be playing outside after school, but not many seemed to be involved in organized activities or sports. (Scan Observation).*

The participants echoed our observation that an opportunity to increase physical activity would be to initiate more organized activities.

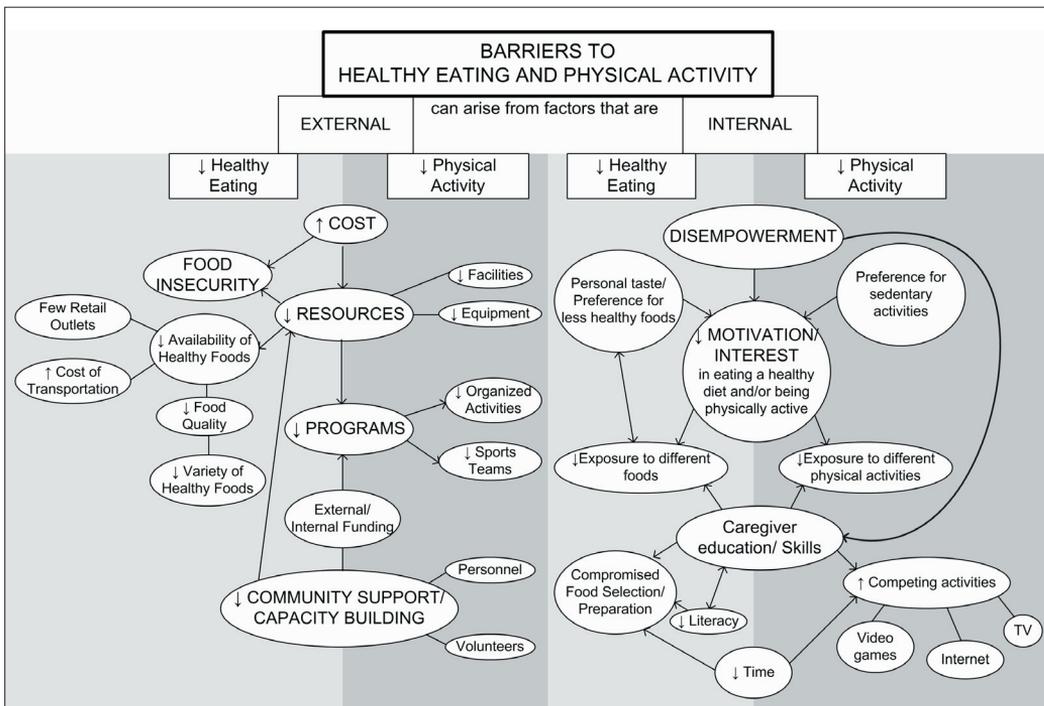


Figure 2.A concept map of the barriers to healthy eating and physical activity in Fort Albany.

*...we need to have more organized activities outside of the school...there used to be baseball and even the elders played. We should try to start some sports leagues and have tournaments and prizes. We could even compete against other communities (Adult Focus Group 2).*

The participants were able to identify opportunities and felt that a number of them were feasible. It just required that a community member take the initiative. It was also suggested that it would be beneficial to consider what other communities in the region were doing to reduce barriers to healthy eating and physical activity.

### **Barriers and supports**

A list of barriers and supports for nutrition and physical activity in Fort Albany were identified by the participants (Table V). It seemed easier for adult participants to identify barriers to healthy eating than physical activity. Youth participants were easily able to (a) distinguish between the healthy and unhealthy foods that they eat, (b) identify their favorite foods and healthy foods that they enjoy, (c) identify physically active and non-active sedentary activities they participate in, as well as activities they would like to do (Table V). It was much more difficult for the students to ascertain barriers to their health behaviours when asked "What kinds of things do you think prevent you from eating healthier foods, or being more physically active?". Their responses tended to be short, one word answers. Despite this, their replies confirmed some of the barriers identified during discussions with the adult participants.

Barriers and supports were also identified from observations recorded during the environmental scan. For example, since the

community is isolated and primarily accessible only by plane, the cost of purchasing marketed food is high (44). As a result of the length of time required for transport, variety is limited, the quality of fresh produce is poor, and perishable foods quickly deteriorate in quality.

## **DISCUSSION**

Although this research examined a remote FN community with a distinctive cultural and physical environment, a number of our findings were supported by other studies of non-Aboriginal youths. To some extent, barriers to healthy eating and physical activity may transcend geographic and cultural differences. However, it was evident that barriers to healthy living are heightened and more limiting in remote populations. Additionally, due to a lack of capacity at the community level, there may be less opportunity for supports. The most intriguing finding from this study was that empowerment emerged as the core issue contributing to physical activity and healthy eating.

Wallerstein (47) defines empowerment as "a social action process that promotes participation of people, organizations, and communities towards the goals of increased individual and community control, political efficacy, improved quality of community life and social justice". In a review of health and social science research related to powerlessness and disease, Wallerstein found that empowerment can play an important role in health-enhancing strategies (47). Empowerment is a key issue for many Aboriginal communities in Canada, and should be incorporated into the design of public health interventions. Indeed,

**Table V.** Barriers and supports for healthy eating and physical activity in FAFN

Barriers/Threats	Supports/Opportunities
Food insecurity*	School snack/breakfast program
Cost	Accessibility of current facilities
Availability	Community centre
Variety	Gymnasium
Quality	School kitchen
Socio-economic status	Opportunities to:
Remoteness	Expand and enhance current programs
Lack of resources	Introduce new programs
Funding	Increase organized activities
Personnel	Build community capacity
Equipment	Students were able to identify some healthy
Facilities	foods they enjoyed eating
Programs	
Training	
Low literacy	
Disempowerment	
Personal preference/taste	
Less exposure to different foods	
Lack of time and motivation/interest	
Competing activities	

\* Food insecurity includes problems in obtaining nutritionally adequate and safe foods due to a lack of money to purchase them, or to the limited availability of these foods in geographically isolated communities (45, 46).

individual and collective empowerment is a common goal in Aboriginal communities (48).

This study revealed that there were numerous interrelated community contextual factors which contribute to the food and physical activity behaviours of FN adolescents living in Fort Albany. These involved various factors facilitating and impeding healthy eating and active living. This study represents an initial exploration of the interactions among the determinants influencing food and physical activity behaviours, which require further examination (49, 50), especially in Aboriginal populations.

Many FNs have unique characteristics, creating challenges specific to their communities and implications for health status. These include the degree of isolation and remoteness which affects the accessibility of health

care services, the availability and cost of food, and opportunities for employment and education (51). These, in turn, affect socio-economic status. Both nutrition and physical activity behaviours are greatly affected by the physical environment in remote FN communities. The current study identified food insecurity related to food cost, poor variety and constraints as barriers, as has been identified by others (49,52,53). Barriers to physical activity included competing activities (e.g., television, video games), lack of trained personnel, facility limitations and insufficient equipment; these impediments were also reported by Thompson et al. (38) for American Indian children.

Similar to the findings from this study, research studies in non-Aboriginal youth populations have identified both extrinsic and intrinsic barriers to physical activity

and healthy eating. Romero (54) found that increased physical activity in a cohort of middle-school-aged youths from a low-income neighbourhood was associated with more hours spent in after-school programs and the perception of a higher quality of local facilities. Other studies have found that access to play spaces and equipment were associated with higher rates of physical activity (55). Allison et al. (56) found that male adolescents' perceived barriers to physical activity included involvement in technology-related activities (television, video games, internet and computer time), lack of time, and the inaccessibility and cost of facilities. A study investigating the differences for barriers to physical activity between male and female adolescents found that "having no time to exercise" was the most common response for females, whereas males were most likely to report "wanting to do other things with my time" (57). O'Dea used focus groups with students in grades 2 to 11 to determine their perceived benefits of, and barriers to, healthful eating and physical activity (58). She found that the major barriers to physical activity included a preference for indoor activities (TV, videos, computer), low energy level, time constraints, social factors (such as peer pressure and lack of parental support), and lack of motivation. Barriers to healthful eating included the convenience of less healthful alternatives, internal/physiologic preferences, social reinforcement (lack of parental/school support), and reward driven/mood enhancement. High school students from Minneapolis were asked what circumstances made it easier or harder to eat healthy foods. Findings from the focus groups showed that convenience, availability and cost were cited the most often as factors influencing their food choices (14).

Our findings are consistent with ecological models of physical activity and obesity (50,59). These models suggest that the influencers of food intake and physical activity include dimensions from both macro- and micro-systems analogous to the external factors affecting health eating and activity in the current study and mediators analogous to internal factors (e.g. Figure 2).

Barriers and supports to healthy eating and physical activity have not previously been examined in sub-arctic Canada, and these findings therefore have direct importance for the specific community of Fort Albany and other sub-arctic communities. The findings of the present study have immediate application in planning for capacity building and initiating community-driven changes for Fort Albany FN. In the words of one study participant, "We must get everyone together, fund-raise and do some planning. The parents and community should take action. We must plan ahead and must be determined to do it."

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